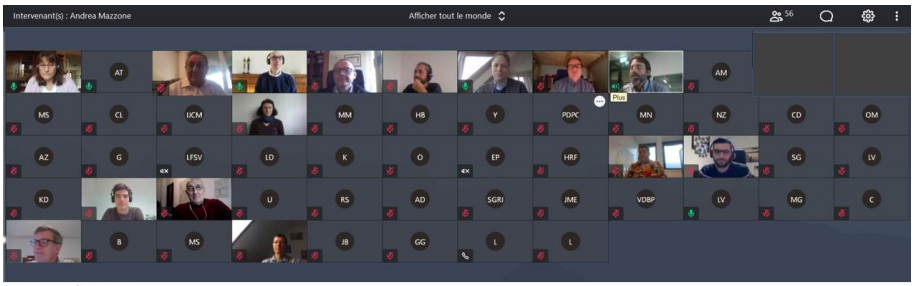
Newsletter

Issue 2, February 2021

Foreword

On 18 December 2020, the Final event of the Shift2Rail JU funded IP5 Marathon2Operation Project took place remotely. This event concluded 2 years of exciting work with dedicated partners and gave them the opportunity to present their results to more than 90 participants coming from the European railway community and beyond.



This newsletter sums up the main results achieved by the Marathon2Operations Consortium. All project documents, presentations delivered during the final event and deliverables can be found on the project website at: https://www.marathon2operation.eu/web/.

FACTS AND FIGURES

Total budget
€0,6 million

Duration
2 years

Project start date
01/12/ 2018

Project end date
31/12/2020

Partners
6 partners from 4 Countries

Grant agreement
826087

Project Coordinator
Università degli Studi di Roma "Tor Vergata"

After setting up some general analysis on the interested segments, on the possible consists, on the possible radio communication solutions between the TUs[1] of the DPS[2] trains and performing many simulations to define general guidelines for several train compositions avoiding major derailment risks or consists disruption, M2O has tackled more precise safety analysis in the second period with the target of enabling safe tests runs to be performed by FR8RAIL II Partners.

In close collaboration with FR8RAIL II Partners responsible for the TUs, the DBCU[3], the train operation and the infrastructure characteristics, M2O has developed a rigorous safety analysis of DPS train.

The preliminary analyses supported by more simulations enabled to define a list of safety requirements for such trains to be fulfilled by technical characteristics of the equipment involved or by operational processes. From this preliminary analysis (D2.3), a hazard log was elaborated leading to analyse the safety of the consist when radio connection was working properly or not and to elaborate a list of mitigations in case some requirements could not be fulfilled directly by the equipment in place (D3.2). This constituted the complete safety analysis for the whole train consist leaving to FR8RAIL II Partners to complete it with the inside TU safety elements.

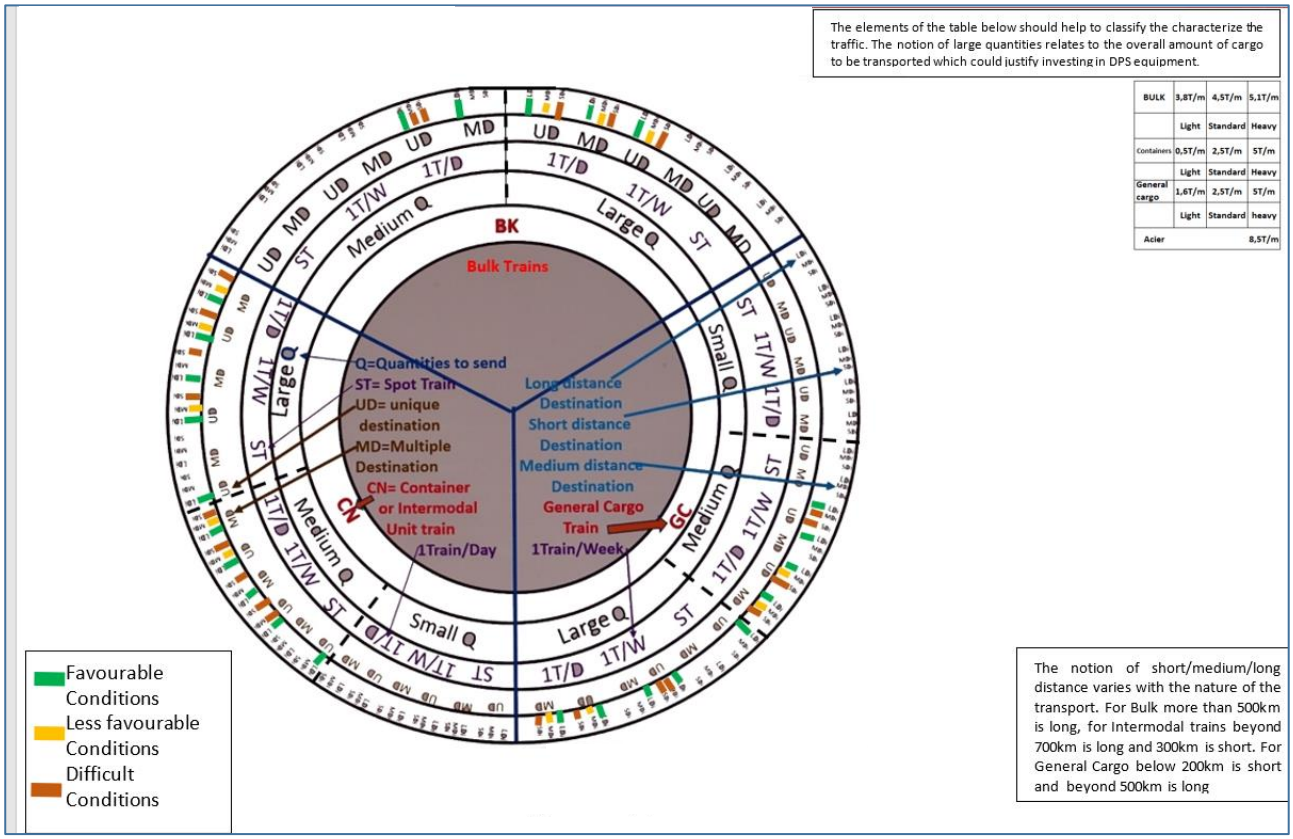
Knowing where the test campaign will take place, comparative simulations using reference trains having effectively run on these tracks with high gradients were performed to analyse the effect of DPS on LTD[4] which appeared generally positive in the most critical situations but for some cases where however the LTD were under the limits of derailment or disruption of the consist.

In parallel satisfactory tests on site on the availability of the radio communication based on LTE[5] all along the track to be used for the test campaign were performed enabling to confirm also the latency time for the execution of the orders of the lead TU by the guided TUs. Moreover, the future transition to FRMCS[6] of the architecture of the DPS system was studied showing the modifications necessary (D3.4) – so DPS can be labelled as "FRMCS ready".

At the end of the project. the type of consist was described with the type of wagons empty or fully loaded. Using these data M2O simulated families of consists to suggest a precise wagon composition which should be safe for the test campaign.

In parallel, having got different types of consists being simulated which could interest various market segments M2O analysed the main fields where efficiency progress could boost a market uptake. A general representation of the conclusions is in the picture hereunder.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 826087.



Key parameters for DPS trains

A more detailed analysis with some examples of possible consists are presented on the website. They show the great interest for heavy bulk transport, for long distance intermodal trains (combined transport or rolling motorways) and for conventional consists from clusters of industry to distant destinations. All these general analyses will have to be adapted to the specific data of each precise business case of a User.

An assessment of the safety analysis performed by M2O with the limits of available data has been made by an independent assessor. The results of the assessment performed by M2O will support the overall safety demonstration of the DPS train by the Partners of FR8RAIL II having the safety data of the TUs and DBCU.

The implementation possibilities briefly shown in the picture above are taken into account for a roadmap suggested to the authorities to set up, if necessary, incentives to accelerate the market uptake in order to develop a modal shift and increase the competitiveness and the sustainability.

The test campaign is performed presently, and first results confirm the main achievements of M2O project enabling to assess properly the LTD and consolidate the capacity of finalising rapidly complete safety case for families of consists. Moreover, drivers appreciate DPS consists tested. This will boost the developments of such DPS trains which are the quickest way to increase Network capacity, upgrade rail freight transport competitiveness and relaunch the growth of rail freight which strategic role has been largely demonstrated during the present pandemic.

[1] TUs: Traction Units
[2] DPS: Distributed Power System
[3] DBCU: Distributed Braking Control Unit
[4] LTD: Longitudinal Train Dynamics
[5] LTE: Long Term Evolution (4G-Wireless Network)
[6] FRMCS: Future Railway Mobile Communication System

Interested in learning more about the results of the Marathon2Operation project?

Please contact: Luciano CANTONE, Project Coordinator at University of Rome Tor Vergata at: Luciano.Cantone@uniroma2.it.

You can also check out all project documents and deliverables on our website at: https://www.marathon2operation.eu/web/

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